UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA and the STATE OF WISCONSIN Plaintiffs, v. P. H. GLATFELTER COMPANY and WTM I COMPANY (f/k/a Wisconsin Tissue Mills Inc.), Defendants.	CIVIL ACTION NO. 03-C-0949 The Honorable Lynn Adelman

VOLUME 2 OF 6

APPENDIX OF PUBLIC COMMENTS ON "CONSENT DECREE FOR REMEDIAL DESIGN AND REMEDIAL ACTION AT OPERABLE UNIT 1 OF THE LOWER FOX RIVER AND GREEN BAY SITE"

Respectfully submitted,

For the United States of America

THOMAS L. SANSONETTI
Assistant Attorney General
Environment and Natural Resources Division

Date: March 8, 2004

S/ Randall M. Stone
RANDALL M. STONE, Trial Attorney
JEFFREY A. SPECTOR, Trial Attorney
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, DC 20044-7611
Phone: (202) 514-1308
Facsimile: (202) 616-6584
E-Mail: RANDALL.STONE@USDOJ.GOV

INDEX OF PUBLIC COMMENTS

VOLUME 2 OF 6

HERRLING, CLARK, HARTZHEIM & SIDDALL LTD.

800 NORTH LYNNDALE DRIVE • APPLETON, WISCONSIN 54914
PHONE (920) 739-7366 • FAX (920) 739-6352

HERRLING CLARK LAW FIRM

Charles J. HARTZHEIM
Michael S. SIDDALL
Charles D. KOEHLER
Kevin LONERGAN
Robert B. LOOMIS
John D. CLAYPOOL
Greg P. CURTIS
Richard T. ELROD
Mark J. McGINNIS
Erika Leuffen SALERNO
Timothy B. ANDERSON
Kelly S. KOSHALEK-RIEHL
Lance E. MUELLER
OF COUNSEL:
Don R. HERRLING
Roger W. CLARK

November 13, 2003

Assistant Attorney General
Environmental and Natural Resources Division
U.S. Department of Justice
P. O. Box 7611
Washington, D.C. 20044-7611

Re: *United States and State of Wisconsin v. P.H. Glatfelter Company and WTM 1 Company*
Civil Action No. 03-C-999 (E.D. Wis.)
D.J. Ref. 90-11-2-1045/2
Public Comment on Consent Decree

Dear Sir or Madam:

Enclosed herewith is Public Comment regarding the proposed Consent Decree in the above case. Although our law firm only represents the Town of Vinland you will note that this Public Comment is being joined by the following municipal entities:

Winnebago County
Town of Oshkosh
Town of Winneconne
Town of Neenah
Town of Winchester
Town of Nekimi
Town of Vinland
Town of Clayton

The documents submitted as part of this Public Comment are listed by attachment to this letter as **Exhibit A**.

Basically, this joint Public Comment supports delaying approval of the Consent Decree until the Wisconsin Department of Natural Resources determines whether or not vitrification will be used as the ultimate disposition remedy for the PCB sediments in Little Lake Butte des Morts (Operable Unit 1).

The Consent Decree and AOC directly pertain to land filling the PCB sediments. Land filling was the selected remedy in the Record of Decision issued in December of 2002 for Operable Unit 1 and Operable Unit 2. These commentators are of the belief that if the selected remedy is changed from land filling to vitrification by the Wisconsin Department of Natural Resources, that the Consent Decree will have to be modified. Nothing in the current Consent

90-11-2-1045/2

HERRLING CLARK LAW FIRM
GREEN BAY OFFICE (920) 465-0660 • NEW LONDON OFFICE (920) 982-6352

Decree is directed toward a disposition remedy involving vitrification for Operable Unit 1 or Operable Unit 2.

Further details are set forth in the Public Comment and supporting Affidavits.

Very truly yours,

Charles D. Koehler

CDK:cp
Enc.

JOINT PUBLIC COMMENT
Eight Municipal Entities
Documents Enclosed

1. PUBLIC COMMENT SUPPORTING THE DELAY OF THE APPROVAL OF THE CONSENT DECREE.

2. Affidavit of Jo-Walter Spear, Sr., Professional Engineer.

3. Affidavit of Raymond Batley, Town Chairman, Town of Vinland.

4. Affidavit of Leonard Leverence, Director of Solid Waste Management for Winnebago County.

5. Affidavit of Steven J. Spanbauer, Town Chairman, Town of Neenah.

6. Affidavit of Charles D. Koehler, Attorney for Town of Vinland.

7. Copy of Petition to Wisconsin Department of Natural Resources and EPA requesting amendment to Record of Decision for Operable Unit 1 and Operable Unit 2 to change the selected remedy for disposition of PCB sediments from landfilling to vitrification.

EXHIBIT A

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

PUBLIC COMMENT SUPPORTING DELAY OF THE APPROVAL OF THE CONSENT DECREE

Case No. 03-C-999

INTRODUCTION

Pursuant to 42 U.S.C. § 9622(d)(2)(B), 42 U.S.C. § 6973(d) and 28 CFR § 50.7, these Commenting Parties submit this public comment in response to the Notice of Lodging of Consent Decree under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) published in the Federal Register on October 17, 2003 in Volume 68, number 201, pages 59821-59822.

COMMENTING PARTIES AND THEIR INTERESTS IN THIS PROCEEDING

The following parties submit this public comment and shall hereinafter be referred to as the "Commenting Parties":

Town of Vinland
Town of Winneconne
Winnebago County
Town of Winchester
Town of Oshkosh
Town of Neenah
Town of Clayton
Town of Nekimi

Each of the above-listed parties is a municipality or a political corporation organized and existing under the laws of the State of Wisconsin. Further, each of the Commenting Parties is located in or near the area immediately surrounding the lower Fox River area which constitutes a portion of Operable Unit 1 (OU1) for purposes of the proposed Consent Decree and will be directly affected by the proposed decree and lower Fox River cleanup efforts.

SUMMARY

The Commenting Parties commend the efforts of the EPA and WDNR to deal with the polychlorinated biphenyl (PCB) sediments in Operable Unit 1 (Little Lake Butte des Morts) as proposed by the U.S. Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR), hereinafter the "Agencies". The only objection being respectfully submitted by the Commenting Parties pertains to the disposal of dredged sediments remedy for OU1 selected in the December 2002 Record of Decision (ROD) issued jointly by the EPA and the WDNR which would be adopted and undertaken should the Consent Decree be approved which provides that the removed sediments and the toxic materials contained therein must be deposited into local landfills.

Land filling of toxic PCB sediments that will last in the environment for an unknown period believed to be as long as 800 years is the wrong remedial solution for ridding the environment of these hazardous chemicals. Vitrification by a process known as Glass Furnace Technology (GFT) has been tested, is available, and has been recognized by both the DNR and EPA as a method of permanent elimination of these chemical compounds from the environment. GFT represents a cost effective, available, permanent solution to Fox River PCB pollution. Land filling is a hasty and inappropriate remedy. No compelling explanation has been provided to date by the Wisconsin Department of Natural Resources or the EPA for favoring land filling

over vitrification. The U.S. Attorney General is empowered to withdraw or withhold its consent to the proposed decree where comments submitted **"disclose facts or considerations which indicate that the proposed judgment is inappropriate, improper, or inadequate."** 42 U.S.C. § 9622(d)(2)(B). Accordingly, the Commenting Parties submit that the Attorney General and the Court should withhold their consent and approval of the proposed decree because approval of the decree will result in the inadequate and inappropriate removal of PCB's from the lower Fox River area.

COMMENT

The Consent Decree as proposed adopts and orders the Defendants, Glatfelter and WTM I Company, to proceed in accordance with the Record of Decision attached as Appendix H and the Administrative Order on Consent (AOC) attached as Appendix F. As alluded to earlier, both documents require that the extracted PCB sediments from Operable Unit 1 (Little Lake Butte des Morts) be deposited in a landfill.

A. Land filling is an Inadequate and Inappropriate Remedy.

The proposed landfill remedy is not permanent, but instead merely a relocation of the toxic substance from the bottom of the lake to a landfill. Currently, the landfill under application with the Wisconsin Department of Natural Resources is located on County Road G in the Town of Vinland approximately seven miles from Little Lake Butte des Morts. This landfill is privately owned by Georgia-Pacific Corporation.

No plan of operation has been approved, no feasibility study has been undertaken, and no local contract has been negotiated with the Town of Vinland in which this landfill is located. There is no assurance that this landfill will be determined feasible or permitted for the dumping of the PCB sediments, but it is believed to be presently the only landfill site under consideration.

The PCB sediments consist of nearly 800,000 tons of which 16,000 tons contain greater than 50 parts per million bringing the dredgings under jurisdiction of the Toxic Substances Control Act. These PCB toxins are extraordinarily durable chemical molecules anticipated to last in the environment from between 600 to 800 years.

It is known that PCB molecules can become soluble. PCB molecules have been detected in leachate escaping from the Winnebago County landfill where both PCB sediments and other PCB refuse has been deposited. The problem with escaping sediments or leachates is that it is reintroduced into the environment. The problem with collected leachate creates yet another environmental problem, namely that the local sewage treatment plant will not accept PCB leachate containing any quantities in excess of .5 (1/2) parts per million. Traditional sewage treatment processes do not eliminate PCBs from wastewater.

Beyond leachate issues, additional problems with land filling PCB's involve the life expectancy of the integrity of vinyl liners installed to contain the sediments. There is no actual experience demonstrating an 800-year needed life expectancy of vinyl liners proposed for use in this landfill. The projected life expectancy of landfill liners is 125 years. This does not take into account inadvertent tears or holes resulting from the installation and operation processes involving the use of heavy equipment. In other words, one might expect that even in the most perfect situation the contents of the landfill containing the toxic PCB sediments may have to be excavated and relocated to a new landfill every 125 years during the 600 to 800 year life cycle.

B. Vitrification as a Cost Effective, Available and Permanent Alternative.

The Commenting Parties are unanimously in support of vitrification using GFT for the permanent neutralization of the PCB sediments. Vitrification is acknowledged in the Record of Decision for OU1 on pages 58 and 60 as a viable alternative to land filling. Minergy Corp., a

Wisconsin corporation, currently operates a vitrification plant for burning paper mill sludge located in the City of Neenah on the shore of Little Lake Butte des Morts (a part of OU1). This is current the largest vitrification plant in North America according to Minergy. Minergy has constructed and operated a test plant under EPA and DNR supervision confirming GFT is an effective and permanent means of totally neutralizing and eliminating PCBs in a cost effective manner with no other material adverse environmental consequences. Minergy has performed exhaustive studies regarding their capabilities in using GFT to completely treat the entire extracted volume of PCB sediments from Little Lake Butte des Morts. GFT is both feasible and cost effective according to Minergy. The plant expansion necessary to be constructed to undertake this project can be completed in one year from start to finish. Minergy's plant is located adjacent to vacant land on the shore of Little Lake Butte des Morts where the dredged PCBs are planned to be removed for dewatering. In other words, space is available for construction of the Minergy plant expansion necessary to neutralize PCB sediments using GFT.

GFT involves a melting process. The resulting component from the GFT process is dark colored glass-like particles similar to those that are obtained from melting silica sand. These particles can be reused in such construction applications as asphalt aggregate for roads and highways and roofing materials such as shingles. According to Minergy, these glass particles from the test plant operated by Minergy have been tested by the EPA and be found more free from residual PCB molecules than that typically found in commonly consumed foods such as cheese or beef steak.

The EPA and WDNR have acknowledged that **"an ongoing evaluation by the Agencies has indicated the potential viability of vitrification as an alternative to the disposal of PCB – contaminated sediments in an engineered landfill",** stating **that "[i]f this technology is**

determined to be an appropriate substitute for sediment disposal, the Agencies would address this modification through an ROD amendment." (See Fox River and Green Bay Record of Decision for OU's 3, 4, and 5 pg. 130.) Consequently, the Agencies themselves acknowledge (this acknowledgement comes *after* the ROD for OU1 was approved) that vitrification may be a viable alternative and may prove to be an appropriate substitute in the near future. In fact, the Agencies have admitted **that "if successfully implemented, vitrification is an effective technology, has the added benefit of destruction of PCBs, and would allow beneficial reuse of dredged sediment."**

With respect to Operable Units 3, 4, and 5 of the Fox River clean up project, the Agencies have identified a number of criteria which will be considered prior to the use of vitrification. According to the Agencies, the criteria include **"the ability of vitrification technology to treat the chemicals of concern, the cost of constructing and operating of vitrification facility, the amount of dredged material that would be managed at the vitrification facility, and issues related to siting a facility."** As noted, studies indicate that vitrification can in fact treat the chemicals of concern and that siting of the facility is of little concern as Minergy owns the plant necessary to do so at this point in time. Additionally, as noted, Minergy has provided estimates regarding the cost of constructing and operating its vitrification facility indicating that the process may in fact be more cost effective than land filling the sediments.

Importantly, the EPA's Superfund Innovative Technology Evaluation (SITE) program is participating in the study of GFT and conducting an independent evaluation of the cost and treatment effectiveness of vitrification technology. The Agencies acknowledge that **"reports prepared by Minergy and submitted to the WDNR and EPA did demonstrate the**

effectiveness of the technology and provided initial cost information." Further, **"while the SITE report is not yet final, initial indications are that vitrification using Glass Furnace Technology has been demonstrated to be successful at treating PCB contaminated sediment."** In other words, the SITE report which is apparently in its latter stages of development indicates that vitrification is a viable alternative. Therefore, it would be inappropriate to approve the proposed Consent Decree thereby requiring land filling of the dredged sediments when a viable alternative, permanent, and environmentally friendly is near receiving approval.

The Agencies, in the ROD for OU's 3, 4, and 5 address the costs to construct and operate a GFT facility. The Agencies developed a unit cost range for treating dredged sediments by means of vitrification. The Agencies point out **"that the unit cost increased as the amount of material managed at a vitrification facility decreases."** Therefore, although vitrification is already believed to be a cost effective method for treating the PCB contaminated sediments, should vitrification be used for an OU1, the costs would decrease overall (for all OU's) making vitrification an even more attractive option for OU's 3, 4, and 1.

Also, the Agencies have acknowledged that:

> **"The states siting law requires that the owners of a proposed landfill negotiate a host agreement with the community in which the landfill will be located. These negotiations can place limits on the size and operation of a landfill and the type of materials accepted, can lead to negotiation of a host community fee, and can be time consuming. An inability to successfully negotiate an agreement may result in the need to seek an alternative location for the proposed disposal facility or to seek a means to manage the dredged material, such as vitrification."**

In other words, the Agencies recognize the difficulties associated with the land filling project and have further acknowledged that vitrification may be a viable alternative. The Record of Decision for OU1 as it presently exists as released in December, 2002 does not authorize

vitrification but mandates land filling. Accordingly, the ROD must be amended and the consent decree as proposed is inadequate.

Finally, the Agencies have acknowledged that **"vitrification is a potentially viable technology for the management of dredged material for the lower Fox River."** The Agencies will allow for vitrification technology to be used on all or part of the contaminated sediment dredged from the River **"under a number of circumstances including for protection of human health and the environment, lack of disposal capacity and cost."** The same language is not included in the ROD for OU1. Accordingly, as such changes may prove necessary, and as vitrification may serve as an invaluable alternative to land filling, the ROD must be amended and the Consent Decree as proposed is inappropriate.

C. The OU1 Record of Decision.

In a presentation made by the Wisconsin Department of Natural Resources, through Ed Lynch, who is the individual who wrote the Record of Decision for OU1, Mr. Lynch advised the Town of Vinland officials as follows:

1. When the Record of Decision in December was issued in December 2002, all financial information regarding the cost of vitrification for OU1 had not yet been received by the DNR. New updated cost information was provided in June of 2003.

2. The estimated time to complete the land filling process is three to six years. The estimated time to complete vitrification is seven years.

3. Vitrification is currently being considered as a viable means of PCP elimination for Operable Unit 3 and Operable Unit 4 of the Fox River cleanup project.

On pages 60 and 61 of the Record of Decision it should be noted that the criteria for evaluating the methods of handling the PCB sediments dredged from Little Lake Butte des Morts

include both landfilling and vitrification. These Commenting Parties take exception to the categorization of landfilling as being a long-term solution. The dredging process may be a long-term solution for the clean up of the Fox River, but landfilling is not a long-term solution for ridding the environment of this toxic substance. Vitrification accomplishes the long-term elimination objective with certainty. Landfilling does not accomplish this objective because the PCB molecules are merely relocated from one location (the lake) to another (the landfill). Interestingly, the cost of utilizing vitrification for OU1 in the ROD attached to the Consent Decree is listed as $63.6 million and the cost of landfilling is listed at $66.2 million. (See ROD page 61). The unit cost of vitrification is impacted by the length of time over which the vitrification plant will operate, which in turn is a function of the volume of sediments to be processed.

The Town of Vinland officials asked Ed Lynch of the Wisconsin DNR at the time of his presentation on September 24, 2003 why vitrification was not selected as the favored remedy over land filling. His answer was that the land filling would be accomplished sooner and all parties involved in the clean-up process were anxious to get underway. The Town officials responded by saying that the difference between three to six years for relocating the problematic PCB sediments compared to seven years for permanently eliminating the PCBs from the environment did not justify rushing the landfill remedy to solve a PCB environmental problem, which has been developing slowly over the past many decades. One extra year for vitrification seems to be an insignificant delay.

Mr. Lynch acknowledged, upon questioning by Town responsibilities, that had the most recent unit cost estimates by Minergy for vitrification been available when the Record of

Decision was issued for OU1, it is possible vitrification may have been considered to be the favored and selected remedy instead of land filling.

Currently, the Commenting Parties are petitioning the State of Wisconsin Department of Natural Resources and the EPA to amend the Record of Decision for OU1 (Little Lake Butte des Morts) to make vitrification the selected remedy. A copy of that petition is enclosed for reference herewith.

This commentary is supported by Affidavits from the following individuals:

1. J.W. Spear, Consulting Professional Engineer, J. Spear Associates, 2010 North First Street, Milwaukee, Wisconsin 53212-3202, employed by the Town of Vinland.

2. Raymond Batley, Town Chairman, Town of Vinland, 1519 Cowling Bay Road, Neenah, Wisconsin 54956

3. Leonard Leverence, Director of Solid Waste, Winnebago Solid Waste Management Board, 100 W. County Road Y, Oshkosh, Wisconsin 54901.

4. Steven J. Spanbauer, Town Chairman, Town of Neenah, 490 Sunrise Bay Road, Neenah, Wisconsin 54956.

5. Charles D. Koehler, Herrling, Clark, Hartzheim & Siddall Ltd., 800 North Lynndale Drive, Appleton, Wisconsin 54914, attorney for the Town of Vinland.

D. Future Financial Security/Responsibility.

Currently Wisconsin Statutes Section 289.41, which is the legislative chapter regulating solid waste disposal in the State of Wisconsin, requires financial security to be posted for a limited term of forty (40) years following the closure of the landfill. Although the DNR can extend the term there is no assurance that the owner of the landfill will be financially solvent. Current law creates a substantial void in the question of who will bear responsibility for a landfill containing hazardous substances, namely PCB sediments, which will remain actively toxic in the landfill for the next 600 to 800 years. There is no reason why this potential future financial risk should be borne by either local, state, or federal governments when an immediate and permanent

remedy is available now at a competitive unit cost. This solution is vitrification. Regardless of changes in the law, regarding length of financial security to be provided, or administrative extensions of the term of security, there is no assurance that the responsible companies will even exist for the length of time necessary to back up the financial security required for the next several centuries for monitoring, repair, and replacement or reconstruction of the proposed landfill to contain these PCB sediments. This financial risk is further support for the immediate and permanent remedy of vitrification. The financial responsibility for vitrification should rest with the responsible corporations even if the payout continues for a little longer time than originally projected for land filling. The responsible parties profited from the processes creating the pollution, and now their future profits should be used for cleaning up the pollution. This should not be a taxpayer responsibility. The opportunity exists now to place responsibility where it belongs.

NEW INFORMATION

The new information presented to the WDNR after the Record of Decision was issued in December of 2002 for Operable Unit 1 include the following items:

1. Supplemental Sediment Handling Characterization Report – Glass Furnace Technology, May 30, 2003 prepared for the WDNR by Minergy Corporation.

2. Revised Unit Cost Study, for Commercial – Scale Sediment Melter Facility – Glass Furnace Technology dated May 30, 2003 prepared for the WDNR by Minergy Corporation.

3. Permitting Review for Sediment Melter Facility – May 30, 2003 prepared for WDNR by Minergy Corporation.

4. EPA Superfund Innovative Technology Evaluation (SITE) Demonstration Bulletin. Minergy Glass Furnace Technology. Bulletin EPA/540/MR – 03/500. The Innovative

We quote for the Court's benefit from page 2 of the Supplemental Sediment Handling Characterization Report – Glass Furnace Technology prepared by Minergy Corporation dated May 30, 2003 submitted to the WDNR by Minergy Corporation as follows:

> **"1.3 beneficial features of GFT**
>
> **The GFT process has many beneficial features for treatment of dredged sediment. The primary feature of the GFT is that the system is designed to create a high quality glass from the mineral component of the sediment. The glass making process uses high temperatures (2600-2900 degrees F) to melt the minerals contained in the sediment. These high temperatures result in very high destruction efficiency of PCBs and other organic contaminants. The GFT process avoids land filling of sediment, as the glass product is readily sold to construction companies. Because the final product is glass, it is very inert and does not leach into the environment.**
>
> **The GFT process is beneficial in comparison with other treatment or vitrification systems. An incinerator would require large quantities of fuel for treatment of low-organic-content sediment, such as the sediment used in this Study, and would generate large amounts of ash which require land filling. Unlike other vitrification technologies, GFT is designed to melt materials using very little auxiliary fuel. Other vitrification systems typically require very high electric or natural has consumption. GFT is based on commercial glass-making technology which operates in a more energy efficient manner."**

The foregoing reports issued May 30, 2003 to the WDNR were not in the possession of the WDNR or the EPA in December of 2002 when the Record of Decision of December 2002 attached to the Consent Decree in this action as appendix H was issued. For copies of the foregoing reports, see Affidavit of Charles D. Koehler submitted herewith.

CONCLUSION

The land filling of the PCB sediments from OU1, Little Lake Butte des Morts, simply relocates this toxic substance when a clean and efficient full neutralization method is available, has been tested, and involves a company (Minergy) eager to undertake the task. It makes no sense to transfer this problem to scores of future generations when a permanent solution can be

implemented to permanently terminate this environmental problem now. The Consent Decree should be delayed until a determination can be made regarding the ultimate disposal of the PCB sediments.

The undersigned municipalities making this Public Comment do not want the PCB sediments to be placed in a landfill which will have to be monitored for an indefinite future time estimated to range from 600 to 800 years in the future.

Dated this 10th day of November, 2003.

SIGNATURES (see following page(s)).

TOWN OF VINLAND

BY: Raymond T. Batley Chairman
Raymond T. Batley Title

6085 County Road T
Oshkosh, WI. 54904
920-235-6953

TOWN OF CLAYTON

BY: Arden E. Schroeder For Chair
Arden E. Schroeder Title

8358 County Road T
Larsen, WI. 54947
920-836-2007

TOWN OF WINNECONNE

BY: Harvey J. Rengstorff Chair
Harvey J. Rengstorff Title

6494 County Road M
Winneconne, WI. 54986
920-582-3260

TOWN OF NEENAH

BY: Steven Spanbauer Town Chairman
Steven Spanbauer Title

1600 Breezewood Lane
Neenah, WI. 54956
920-725-0916

TOWN OF OSHKOSH

BY: Gerald Frey Chair
Gerald Frey Title

230 East County Road Y
Oshkosh, WI. 54901
920-231-5887

TOWN OF WINCHESTER

BY: Michael Schlim Chairman
Michael Schlim Title

8522 Park Way
Larsen, WI. 54947
920-836-2948

TOWN OF WINNECONNE

BY: SEE ABOVE
Title

6494 County Road M
Winneconne, WI. 54986
920-582-3260

TOWN OF NEKIMI

BY: Ronald Miller Chairman
Ronald Miller Title

3790 Pickett Road
Oshkosh, WI. 5490
920-235-0615

WINNEBAGO COUNTY

BY: Jane Vande Hey Chg. Exec
Jane Vande Hey Title

448 Algoma Blvd.
Oshkosh, WI. 54901

OU1 COM 055

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

AFFIDAVIT

Case No. 03-C-999

STATE OF WISCONSIN)
) ss.
COUNTY OF DANE)

Jo-Walter Spear, Sr., being first duly sworn on oath, deposes and states as follows:

1. My name is Jo-Walter Spear, Sr., and I am a licensed professional engineer in Wisconsin and owner of J. Spear Associates, 2010 North First Street, Milwaukee, Wisconsin.

2. That I have 25 years experience in the design, construction, and monitoring of landfills throughout the United States.

3. I am making this Affidavit in support of vitrification as being the preferred remedy for elimination of PCB laden sediments extracted from Little Lake Butte des Morts in Winnebago County.

4. The PCB molecules contained in the sediments of Little Lake Butte des Morts will last in the environment from 600 to 800 years if placed in a landfill.

5. The same toxic PCB molecules can be neutralized into harmless water vapor and carbon dioxide by a process known as vitrification using a process known as gas furnace technology (GFT) which essentially melts the sediments at high temperatures leaving behind a byproduct consisting of small glass particles.

6. Land filling these toxic chemicals contains numerous risks and uncertainties which will continue in the environment for literally centuries.

7. It is a known engineering fact that all landfill liners either leak presently or will leak in the future despite man's best efforts to preserve the integrity of the liners. PCB's can and will become solidable and as solidable will be found in leachate draining from the landfill.

8. Geosynthetic membrane liners currently have unknown life expectancy, but their projected life expectancies do not exceed 125 years. Current technology includes an engineered cap, containing a geosynthetic membrane similar to that in the liner. The cap is designed to minimize infiltration of precipitation and thus the production of leachate within the landfill and reduce the critical issue of liner performance.

9. Caps are monitored and maintained during a 'post closure' period to assure integrity of the Cap. Current regulatory requirements in Wisconsin set the post closure period at 40 years. Once monitoring and maintenance of the Cap ceases the cap will begin to degrade and allow increasing infiltration of precipitation.

10. The landfill and the ground water surrounding the landfill will have to be monitored for the next 600 to 800 years, at a minimum. The landfill is likely to have to be relocated or the cap replaced by some mechanism several times during the lifespan of the toxic substances placed in this landfill.

11. Current Wisconsin law requires only that operators of the landfill provide security for forty years following the closure of the landfill. Therefore, the cost of monitoring, cap maintenance, and/or relocating these PCB's over the next 800 years will fall upon either the local municipalities or government, which is ultimately the taxpayers.

11. Vitrification, by use of GFT, which is a known and tested technology for the immediate and complete neutralization of PCB molecules, is the most sensible methodology for eliminating the environment of PCB contaminants found in the bottom of Little Lake Butte des Morts and has been selected for reaches of the Fox River below Lake Butte des Morts.

12. Proceeding now with landfilling is environmentally irresponsible.

Dated this 11th day of November, 2003

Joe Walter Spear, Sr., P.E.

Subscribed and sworn to before me this
11 day of November, 2003

OU1 COM 057

Leona M. Tilbury Leona M. Tilbary.
Notary Public, State of Wisconsin
My Commission Expires: _____

Leona M. Tilbury
Notary Public, Indiana
Steuben County
Comm. Expires May 15, 2008

OU1 COM 058

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

AFFIDAVIT

Case No. 03-C-999

STATE OF WISCONSIN)
) ss.
COUNTY OF WINNEBAGO)

Raymond Batley, being first duly sworn on oath, deposes and states as follows:

1. My name is Raymond Batley and I am the Town Chairman of the Town of Vinland.

2. The process of analyzing and developing plans for the clean-up of PCB sediments from the Fox River have been in process for many years; however, it was not until June 9, 2003 that the Town of Vinland received the first notice that PCB sediments from Little Lake Butte des Mortes were proposed for being deposited into a landfill owned by Georgia-Pacific Corporation located on County Road G in the Town of Vinland.

3. The Town of Vinland Board is opposed to depositing these PCBs in the Town of Vinland or anywhere else.

4. The Town of Vinland Board has no assurance that Georgia-Pacific Corporation will have any financial liability for the next 800 years necessary to monitor, modify, correct, replace or relocate the liner, the landfill contents or pay for other unforeseen consequences that might result from attempting to contain these PCBs in a landfill for the next 800 years.

5. Currently the landfill in the Town of Vinland has been permitted by the DNR only for the deposit of paper mill sludge pursuant to an agreement made between the Town of Vinland

and Wisconsin Tissue Mills, Inc. in 1996. This agreement specifically states no other substance is to be deposited in this landfill other than paper mill sludge. PCBs are not included as part of the permit or agreement.

6. The Town of Vinland did not negotiate a contract for the deposit of PCB sediments in 1996. The Town has now been requested to begin said negotiations.

7. The Town of Vinland Town Board and its citizens are expressly opposed to depositing these toxic substances in the Town of Vinland or any other landfill because vitrification presents a permanent remedy neutralizing the PCBs.

8. Currently we have been advised by the Wisconsin Department of Natural Resources that approximately 16,000 tons of PCB-laden sediments will contain greater than 50 parts per million of PCBs.

9. On September 24, 2003, at the request of the Town of Vinland, representatives of the Wisconsin Department of Natural Resources came to the Town of Vinland Town Hall and made a presentation to its representative, Ed Lynch, who we were informed was the drafter of the Record of Decision for Operable Unit 1.

10. Among the comments made by Mr. Lynch at the meeting conducted at the Town of Vinland Town Hall were the following:

a. When the Record of Decision in December was issued, all financial information regarding the cost of vitrification for OU1 (Little Lake Butte des Morts) had not yet been received.

b. The estimated time to complete the land filling process is three to six years. The estimated time to complete vitrification is seven years.

c. Vitrification is currently being considered as a viable means of consideration for Operable Unit 3 and Operable Unit 4 of the Fox River cleanup project.

d. The DNR may have included vitrification as a viable remedy for disposal of PCBs in the December 2002 ROD if cost estimates received from Minergy in June 2003 were available in December.

11. Apparently, the Town of Vinland, along with other municipalities in the area, are jointly requesting the Department of Natural Resources and EPA to amend its Record of Decision to identify vitrification as the selected remedy for the treatment of the PCB sediments dredged from Little Lake Butte des Morts, and until that determination is made, this Consent Decree should not go forward.

12. Concurrently, the Town is petitioning the DNR and EPA to amend the Record of Decision for OU1 to change the selected remedy from landfilling to vitrification for the dredged PCB sediments.

13. We believe, and request, that the Consent Decree of the Court in this present action be delayed until the Record of Decision can be amended to provide vitrification as the selected remedy for disposition of sediments in OU1.

14. That on October 16, 2003, a presentation was made on behalf of Minergy Corp. at a public meeting attended by members of various municipalities, public officials and representatives of the Wisconsin Department of Natural Resources. That as chairman of the Town of Vinland I was also present at this meeting. Among the points presented by Minergy in this pubic forum are those items listed on **Exhibit A** attached to this Affidavit.

Dated this 12 day of November, 2003

Raymond Batley

Subscribed and sworn to before me this
12th day of November, 2003.

Shirley M. Brozek
Notary Public, State of Wisconsin
My Commission Expires: 08/26/2007

OU1 COM 061

EXHIBIT A

PRESENTATION SUBJECT MATTER AT PUBLIC FORUM REGARDING VITRIFICATION - October 16, 2003

1. Minergy operates the largest vitrification plant in North America in the City of Neenah along the shore of Little Lake Butte des Morts. Currently this plant vitrifies paper mill sludge. Minergy has been vitrifying paper sludge since 1998.

2. Minergy conducted a successful test vitrification project in year 2001 which used gas furnace technology to vitrify river sediments containing PCBs. This project resulted in near complete neutralization of PCBs and produced a usable by-product consisting of glass granules usable in such construction applications as road building and roofing materials.

3. all resulting emissions from the vitrification of PCB sediments fell below federally acceptable emissions limitations.

4. Minergy has a strong interest in plant expansion for purposes of vitrifying river and lake sediments containing PCBs on an industrial scale basis. There is vacant land adjacent to Minergy's plant site at which an additional vitrification line could be added to Minergy's existing facilities.

5. Minergy studies based in part upon the 2001 test vitrification pilot project have concluded that unit costs of vitrification are competitive with the costs of landfilling the sediments. Minergy's most recent cost estimates and reports regarding vitrification were submitted to the Wisconsin Department of Natural Resources in June of 2003.

6. Minergy studies have shown that plant expansion at Minergy's current vitrification plant to make necessary additions to vitrify lake and river sediments could be completed in 12 months from start to finish.

7. That tested glass granules resulting from the vitrification process test program showed that trace amounts of PCBs in the glass granules was in smaller concentration than commonly consumed food products such as cheese and beef steak.

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

AFFIDAVIT

Case No. 03-C-999

STATE OF WISCONSIN)
) ss.
COUNTY OF WINNEBAGO)

Leonard Leverence, being first duly sworn on oath, deposes and states as follows:

1. My name is Leonard Leverence and I am the Director of Solid Waste Management for Winnebago County.

2. That I have personal knowledge that the Winnebago County Board has adopted a resolution opposing landfilling of PCB sediments, and a copy of that Resolution is attached as **Exhibit A**.

3. That the Winnebago County Solid Waste Management Board has passed a resolution on February 12, 2003 favoring vitrification of PCB sediments, a copy of which is attached as **Exhibit B**.

4. That the sewage treatment plant of the City of Oshkosh will not accept PCB contaminated leachate.

5. That currently we have been advised by the Wisconsin Department of Natural Resources that approximately 16,000 tons of PCB-laden sediments will contain greater than 50 parts per million of PCBs.

6. That as Director of the Solid Waste Committee of Winnebago County, it is my opinion that vitrification of PCBs is the only sensible remedial solution to elimination of PCBs from the environment on a long-term basis.

7. Land filling of PCB sediments is merely a temporary solution that will require further monitoring, costs, and related expenses passed to future generations with real, but unknown, risks continuing for the next several hundred years.

Dated this 12th day of November, 2003.

Leonard Leverence

Subscribed and sworn to before me this
12th day of November, 2003.

Notary Public, State of Wisconsin
My Commission Expires: Sept. 26, 2004

OU1 COM 064

278-102003

RESOLUTION: **Support Vitrification of PCB Waste from Operating Unit #1**

TO THE WINNEBAGO COUNTY BOARD OF SUPERVISORS:

WHEREAS, it is presently proposed by the Department of Natural Resources that PCB-laden sediments are proposed for deposit in the Georgia Pacific Landfill Site located in the Town of Vinland; and

WHEREAS, on September 24, 2003, the Department of Natural Resources indicated that vitrification (gas furnace technology) was considered as a part of the record of decision for disposal of sediments from operable Units #3 and #4 but not from operable Unit # 1 located in Little Lake Butte des Morts; and

WHEREAS, the landfilling of toxic PCB sediments will allow such sediments to lay in a landfill for hundreds of years and will require monitoring for centuries. The cost of landfilling such sediments is estimated at $66,000,000.00; and

WHEREAS, vitrification would neutralize entirely the toxicity of PCB's and would take 7 years at a cost of $80,000,000 to $100,000,000 for operable Unit #1; and

WHEREAS, the Town of Vinland and the Winnebago County Solid Waste Management Board have passed resolutions calling for the vitrification, as opposed to the landfilling, of PCB-laden waste from operable Unit #1.

NOW, THEREFORE, BE IT RESOLVED by the Winnebago County Board of Supervisors that it hereby indicates its support for the vitrification of PCB-laden waste from operable Unit #1 in Little Lake Butte des Morts as opposed to the landfilling of said substances.

BE IT FURTHER RESOLVED by the Winnebago County Board of Supervisors that it hereby it urges the Winnebago County Solid Waste Management Board to formally petition the Wisconsin Department of Natural Resources for reconsideration of their decision with regard to this matter .

BE IT FURTHER RESOLVED by the Winnebago County Board of Supervisors that a copy of this resolution be transmitted by the Winnebago County Clerk to the office of the Secretary of the Wisconsin Department of Natural Resources; to all Federal and State Legislators representing constituents within Winnebago County; to the Wisconsin Counties Association and to the Office of Governor James Doyle.

Submitted by:

CHUCK FARREY, DIST. #30
PATRICK O'BRIEN, DIST. #38
COUNTY BOARD SUPERVISORS

Vote Requirement for Passage:
Majority of those present

Approved by Winnebago County Executive this 30 day of

OCT, 2003.

County Executive

OU1 COM 065

EXHIBIT A

Winnebago County Solid Waste Management Resolution
Opposing Landfill Disposal of Fox River Contaminated Sediment
February 12, 2003

Whereas the Winnebago County Solid Waste Management Board (WCSWMB) owns and operates a municipal solid waste landfill and,

Whereas the WCSWMB assisted the Wisconsin Department of Natural Resources in participating in the pilot demonstration project by accepting low level contaminated poly chlorinated biphenyl chlorides (PCB's) in the Winnebago County landfill and,

Whereas after careful consideration and experience the WCSWMB believes and recommends that the long-term solution to permanent remediation of the contaminated Fox River sediment would be to utilize thermal reduction technology rather than entombment into a landfill.

Therefore, the WCSWMB hereby recommends that thermal reduction technology be utilized to permanently remediate the Fox River contaminated sediment rather than landfill entombment.

By: Winnebago County Solid Waste Management Board

Patrick O'Brien, Chairman

Leonard Leverence, Director of Solid Waste

Approved by SWMB Feb 12, 2003

OU1 COM 066

EXHIBIT B

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

AFFIDAVIT

Case No. 03-C-999

STATE OF WISCONSIN)
) ss.
COUNTY OF WINNEBAGO)

Steven J. Spanbauer, being first duly sworn on oath, deposes and states as follows:

1. My name is Steven J. Spanbauer and I am the Town Chairman of the Town of Neenah.

2. That the Town of Neenah has passed a resolution attached hereto as Exhibit A.

3. Pursuant to the attached resolution, the Town of Neenah opposes land filling of PCB-laden sediments.

4. That the Town of Neenah supports vitrification of the PCB-laden waste from Operable Unit 1 in Little Lake Butte des Mortes.

Dated this 12 day of November, 2003

Steven J. Spanbauer, Town of Neenah Chairman

Subscribed and sworn to before me this
12th day of November, 2003.

Notary Public, State of Wisconsin
My Commission Expires: 08/26/2007

OU1 COM 067

TOWN OF NEENAH – RESOLUTION TO SUPPORT THE

TOWN OF VINLAND

TO HALT THE PLAN FOR LANDFILLING OF PCB-LADEN SEDIMENTS

WHEREAS, it is currently proposed by the Wisconsin Department of Natural Resources that PCB-laden sediments from Little Lake Butte des Morts are to be deposited in a landfill located in the Town of Vinland, Winnebago County, Wisconsin; and

WHEREAS, the plan to disturb and remove these PCBs from the Lake and the Fox River system is controversial, nonetheless the commitment put forth by the State and the EPA is commendable; and

WHEREAS, the DNR is considering vitrification (gas furnace technology) as a part of the Record of Decision for the sediment removed from other Operable Units in the Fox River system, they have proposed to landfill the PCB-laden sediments from Operable Unit #1 located in Little Lake Butte des Morts; and

WHEREAS, the landfilling of PCBs will allow toxic components to lay in the ground for hundreds of years and will require monitoring for centuries at tremendous continued costs; and

WHEREAS, the responsibility on the part of the landfill operator ceases after 40 years following closure and the necessity for clean-up remains forever as a burden to future generations; and

WHEREAS, the technology for vitrification exists, the EPA has verified that vitrification destroys 99.9999% of all PCBs forever, while producing a usable glass aggregate byproduct; and

WHEREAS, the Town of Vinland Board of Supervisors is currently attempting to convince the Wisconsin Department of Natural Resources that landfilling these PCBs is not in the long-term best interest of humanity,

NOW THEREFORE BE IT RESOLVED, that the Town of Neenah Board of Supervisors adopts this resolution in support of a request by the Town of Vinland for vitrification of PCB-laden waste from Operable Unit #1 in Little Lake Butte des Morts as opposed to landfilling.

BE IT FURTHER RESOLVED, that the Town of Neenah Board of Supervisors urges our elected representatives at the State and Federal levels to convince the Wisconsin Department of Natural Resources to reconsider their landfill plans.

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the Wisconsin Department of Natural Resources, to our elected legislators, to the Wisconsin Towns Association, to the Office of Governor Doyle, the United States Environmental Protection Agency, and Minergy Corporation.

Dated this 27th day of October, 2003.

TOWN OF NEENAH

Steven J. Spanbauer, Chairman

Attest:

Carita Williams, Clerk

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN

UNITED STATES OF AMERICA
and the STATE OF WISCONSIN,

Plaintiffs,

v.

P.H. GLATFELTER COMPANY and
WTM I COMPANY
(f/k/a Wisconsin Tissue Mills Inc.),

Defendants.

AFFIDAVIT

Case No.03-C-999

STATE OF WISCONSIN)
) ss.
COUNTY OF OUTAGAMIE)

Charles D. Koehler, being first duly sworn on oath, deposes and states as follows:

1. That I am an attorney representing the Town of Vinland where the Georgia-Pacific Corp. landfill is located and being proposed as the deposit site for OU1 PCB sediments.

2. That attached hereto as **Exhibit A** are selected pages 129-145 from the Record of Decision for Operable Unit 3 and Operable Unit 4 supporting ongoing evaluation of vitrification as being a preferred method of permanent disposal of PCB sediments dredged as part of the Fox River clean up process.

3. That attached hereto as **Exhibit B** is a copy of NR 157.07(1) Wis. Adm. Code designating incineration as the preferred method for elimination of toxic concentrations of PCBs, and designating landfill disposal as an alternate method only when incineration is not technically and economically feasible.

4. That attached hereto as **Exhibit C** is Supplemental Sediment Handling Characterization Report prepared by Minergy Corporation for the Wisconsin Department of Natural Resources dated May 30, 2003.

5. That attached hereto as **Exhibit D** is Permitting Review for Sediment Melter Facility prepared by Minergy Corporation for the Wisconsin Department of Natural Resources dated May 30, 2003.

6. That attached hereto as **Exhibit E** is Revised Unit Cost Study prepared by Minergy Corporation for the Wisconsin Department of Natural Resources dated May 30, 2003.

7. That attached hereto as **Exhibit F** is a Resolution of the Town of Vinland resisting land filling of PCB sediments, in favor of vitrification.

Dated this 12th day of November, 2003

Charles D. Koehler

Subscribed and sworn to before me this
12th day of November, 2003.

Carol Pellinger, Notary Public
State of Wisconsin
My Commission expires 3/21/04

OU1 COM 070

13 SELECTED REMEDY

13.1 The Selected Remedy

The selected remedy for OUs 3 and 4 is Alternative C2B, which is a variation of Alternative C, Dredge and Off-Site Disposal. This remedy includes removal, dewatering, and off-site disposal of an estimated 586,800 cy of PCB-contaminated sediment from OU 3 (Little Rapids to De Pere) and removal, dewatering, and off-site disposal of an estimated 5,880,000 cy of PCB-contaminated sediment from OU 4 (De Pere to Green Bay) with PCB concentrations greater than 1 ppm. The sediments in OU 3 are estimated to contain approximately 1,111 kg (about 2,444 pounds) of PCBs, or approximately 89 percent of the total PCB mass in that OU. In addition, Deposit DD (located in OU 2) will be removed as part of the OU 3 remediation. An estimated PCB mass of 31 kg (68 pounds) and a contaminated sediment volume of 9,000 cy from Deposit DD are included in the OU 3 mass, volume, and cost estimates. Therefore, the estimated totals for OU 3 are 1,142 kg (2,512 pounds) of PCB mass and 595,800 cy of contaminated sediment.

The sediments in OU 4 are estimated to contain approximately 26,430 kg (about 58,150 pounds) of PCBs, or approximately 99 percent of the total PCB mass in that OU. As part of the remediation effort for OU 4, the Agencies will, during the design phase of this project, more clearly define the extent of contamination from the River's mouth out into Green Bay. All sediment contaminated with a PCB concentration of greater than 1 ppm extending from the River mouth will also be subject to dredging. Currently, the Agencies do not have a good estimate of the sediment volume or PCB mass in this area, although it is not expected that the volume of material will exceed a few thousand cubic yards.

The selected remedy for OU 5 is Alternative B, Monitored Natural Recovery and Institutional Controls, with limited dredging near the mouth of the River as part of the OU 4 remediation. The Agencies will also conduct additional modeling and evaluation of risks in Green Bay.

Summary and Description of the Rationale for the Selected Remedy

The following sections address the rationale for the remedy selection for OUs 3 and 4 (discussed together) and OU 5, as well as how the selected alternatives would be implemented. Five-year reviews of remedial activities at each OU will be conducted to determine remedy effectiveness.

Operable Unit 3 (Little Rapids to De Pere) and Operable Unit 4 (De Pere to Green Bay) — Alternative C2B

OUs 3 and 4 are discussed together because of the interdependency of the remedy for these two Operable Units. Alternative C2B includes the removal of sediment with PCB concentrations greater than the 1 ppm RAL using an environmental dredge, followed by dewatering and off-site disposal of the sediment. The total volume of sediment with PCB concentrations greater than 1 ppm to be dredged in this alternative is approximately 595,800 cy (including Deposit DD) from OU 3 and 5,880,000 cy from OU 4. The addition of Deposit DD to the OU 3 cleanup does not substantially alter the Comparative Analysis of Alternatives, because the additional volume and increase in cost are relatively small.

- **Site Mobilization and Preparation:** The final decision on the staging area(s) for these Operable Units will be made during the design stage. Site preparation at the staging area(s) will include collecting soil samples, securing the onshore property for equipment staging, and constructing the necessary onshore facilities for sediment management and

transportation. A docking facility for dredging and ancillary equipment may need to be constructed and multiple staging areas may be necessary.

- **Sediment Removal:** Sediment removal will be conducted using a dredge (e.g., cutterhead or horizontal auger or other method). Given the volumes and operating assumptions described in the FS, completing the removal effort is estimated to take approximately 1 year for OU 3 and 7 years for OU 4. For dredging removal, in-water pipelines will carry the slurry from the dredging area to the staging area(s). For longer pipeline runs, it may be necessary to utilize in-line booster pumps to pump the slurry to the staging area. If necessary, silt curtains may be used around the dredging area to minimize sediment resuspension downstream of the dredging operation. Buoys and other waterway markers will be installed around the perimeter of the in-water work area.

  From the staging area, the sediment slurry would be pumped, via pipeline, to a passive dewatering facility. Preliminary assumptions are that the pipeline could follow the existing route of the Fox River Trail, although a final decision on the pipeline location will be made during the design phase. Estimates are that four booster pumps would be necessary for the pipeline, although the specifics will be determined during the design phase. Dewatered sediment will be disposed of in an adjacent engineered landfill facility. Other activities associated with sediment removal will be water quality monitoring and post-removal sediment surveys in the River, as well as site restoration of the staging area(s) and pipeline route. The staging area(s) and the dewatering and disposal facilities will be fenced to limit access.

- **Sediment Dewatering and Disposal:** Passive dewatering requires land acquisition and construction of the dewatering cells. At this conceptual design stage, the sediment dewatering system is envisioned to be a multi-cell passive dewatering system designed to accommodate 26 weeks of dredge production, including a maximum water surge capacity for multiple construction seasons to enhance the system's dewatering capability. However, the specifics of the dewatering system will be finalized during the design phase. Ancillary activities include water treatment and disposal of solids as well as decommissioning of the dewatering system and site restoration.

  Disposal of dewatered sediment will be at a dedicated NR 500 engineered landfill, which will be operated as a monofill accepting only Lower Fox River sediments. The landfill will be constructed and operated in accordance with the WDNR's TSCA agreement with the EPA, which is necessary if PCB concentrations in sediment are over 50 mg/kg. The disposal facility will be located adjacent to the dewatering facility.

- An ongoing evaluation by the Agencies has indicated the potential viability of vitrification as an alternative to the disposal of PCB-contaminated sediments in an engineered landfill. If this technology is determined to be an appropriate substitute for sediment disposal, the Agencies would address this modification through a ROD amendment. Criteria for the selection and use of vitrification are identified in Section 13.8 of this ROD.

- **Water Treatment:** Water treatment will require the use of equipment and materials for flocculation, clarification, and sand and carbon filtration. Water treatment will be conducted 24 hours per day, 7 days per week during the dredging season. In the FS, the discharge water for hydraulic dredging is estimated at 570,000 gallons per day for OU 3 and 5,131,000 gallons per day for OU 4 during the term of the water treatment activity. Daily discharge water quality monitoring is included in the cost estimate. Treated water will be sampled and analyzed to verify compliance with the appropriate discharge requirements.

- **Demobilization and Site Restoration:** Demobilization and site restoration will involve removing all equipment from the staging and work areas and restoring the site to, at a minimum, its original condition.

- **Institutional Controls and Monitoring:** Baseline monitoring will include pre- and post-remedial sampling of water, sediment, and tissue. Monitoring during implementation will include air and surface water sampling. Verification monitoring to confirm that PCB contamination has been removed to the RAL will include sediment sampling. Long-term monitoring will include surface water, biological tissue, and surface sediment sampling. Details concerning long-term sampling will be developed in the design of the final Long-term Monitoring Plan. Monitoring would continue until acceptable levels of PCBs are reached in sediments, surface water, and fish. The types and frequency of pre-construction monitoring will be developed during remedial design. Plans for monitoring during and after construction will be developed during the remedial design and modified during and after construction, as appropriate. Until the RAOs have been achieved, institutional controls will have to be maintained to help prevent exposure of human receptors to contaminants. Institutional controls may include access restrictions, land use or water use restrictions, possible dredging moratoriums, fish consumption advisories, and domestic water supply restrictions. Land and water use restrictions and access restrictions may require local legislative action and state administrative action to prevent inappropriate use or development of contaminated areas.

- **Achievement of Remedial Action Level (RAL) Objective:** The mass and volume to be remediated will be depend on the dredge elevation that is set to achieve an RAL of 1 ppm. The success of the selected remedy for OU 3 and OU 4 will be evaluated based on removal of all material with a PCB concentration greater than 1 ppm. In addition, a SWAC for each OU will be computed following completion of dredging with samples from 0 to 10 cm depth. If dredging is completed to the dredge elevation representing a 1 ppm removal, based on pre-design sampling data, and post-dredging sampling shows that the 1 ppm RAL has not been achieved, a determination by the Agencies regarding whether the SWAC of 0.26 ppm for OU 3 or a SWAC of 0.25 ppm for OU 4 has been achieved may be used to assess the effectiveness of PCB removal for these Operable Units. A 0.25 ppm SWAC will be deemed acceptable as a level of performance for determining completion. If the appropriate SWAC has not been achieved for either OU 3 or OU 4, then the remedy provides certain options to further reduce risk. The first option is that additional dredging may be undertaken to ensure that all sediments with PCB concentrations greater than the 1 ppm RAL are removed. A second option is to place a sand cover on dredged areas to reduce surficial concentrations such that a SWAC is achieved. This option is discussed further in Section 13.4. These options allow for achievement of the RAL under certain conditions (e.g., obstructions or debris).

Operable Unit 5 (Green Bay) — Alternative B

The selected remedy for OU 5 is Monitored Natural Recovery (MNR) with institutional controls and limited dredging. This remedy includes the following:

- Additional sampling near the mouth of the Lower Fox River to identify sediments with PCB concentrations greater than 1 ppm. Any PCB-contaminated sediments with concentrations greater than1 ppm adjacent to the River mouth will be dredged as an extension of the OU 4 removal. A preliminary (rough) estimate of the volume of material in Green Bay adjacent to the River mouth with PCB concentrations above 1 ppm may be as high as 200,000 cy. This area will be more precisely delineated in design activities.

- Additional evaluation of the contaminant distribution and associated risks in Green Bay, including fate and transport and biological modeling. Estimates regarding recovery times would be developed similar to those completed in the Alternative-Specific Risk Assessment, summarized in Section 8 in the FS.

- Monitoring to confirm long-term recovery of Green Bay, relying on natural processes, primarily dispersion. Neither biodegradation nor burial is expected to occur at a significant rate.

OU 5 is expected to recover eventually through natural processes in combination with removal of the major sources of PCBs to the Bay (i.e., the removal of PCBs from the River sediment and, in part, removal of sediments adjacent to the River mouth). A monitoring program for measuring PCB and possibly mercury levels in water, tissue (e.g., invertebrates, fish, birds), and sediment will be developed as discussed in the FS to measure progress toward and achievement of Site RAOs for the Bay. In summary, the monitoring program will include:

- Surface water quality sampling at several stations in Green Bay to determine the transport of PCB mass within Green Bay and into Lake Michigan

- Fish and possibly waterfowl tissue sampling to determine the residual risk of PCBs and possible mercury consumption to human receptors

- Fish, bird, and zebra mussel tissue sampling to determine the residual risk of PCB uptake to environmental receptors

- Possible avian population studies of bald eagles and double-crested cormorants to assess the residual effects of PCBs and mercury on reproductive viability

- Possible surface sediment sampling to assess potential recontamination from upstream sources and the status of natural recovery

Types and frequency of monitoring to occur during pre-design, construction, and post-remediation will be developed as part of a comprehensive Site monitoring program. Monitoring would continue until acceptable levels of PCBs are reached in sediments, surface water, and fish. Plans will be developed as part of the

Explanation of Remedial Action Level, Surface-Weighted Average Concentration, and Sediment Quality Threshold

The term Remedial Action Level (RAL) refers to a PCB concentration in sediment used to define an area or volume of contaminated sediment that is targeted for remediation. In other words, the RAL in this ROD calls for the removal by dredging of all sediment in OU 3 and OU 4 that has a PCB concentration of greater than 1 ppm. If all sediment with a concentration greater than the 1 ppm RAL is removed, it is expected that the residual Surface-Weighted Average Concentration (SWAC) of sediment will be approximately 0.26 ppm in OU 3 and 0.16 ppm in OU 4. The SWACs in this instance are less than the RAL because a SWAC is calculated as an average concentration over the entire Operable Unit, after the removal of sediment from discrete areas (deposits) that are above the RAL, and includes averaging over areas in which there are surface concentrations less than the RAL. SWAC calculations are discussed in Section 5 of the FS.

The term Sediment Quality Threshold (SQT) refers to the PCB concentration in the sediment that is protective of specified human and ecological receptors. SQTs vary depending on the sensitivity of the particular receptor (such as recreational anglers, high-intake fish consumers, walleye, mink, etc.). Put another way, if the remediation called for in this ROD results in a sediment concentration at or below the SQT, then the risk to specified human and ecological receptors will have been reduced to a safe level. It is important to understand that it is not expected that the SQT will be achieved immediately upon completion of the dredging; rather, the estimated SWAC will be met. For example, the estimated post-dredging SWAC for OU 3 is 0.26 ppm, whereas the SQT for unlimited walleye consumption is 0.049 ppm and would take an estimated 9 years to achieve. It is contemplated that the SQT will be met only after the River is allowed a certain amount of time to "recover" through natural processes following active dredging.

remedial design and modified during and after the upstream remedial construction in OUs 3 and 4, as appropriate.

Until the RAOs have been achieved, existing institutional controls will have to be maintained to help prevent exposure of human receptors to contaminants. Institutional controls may include access restrictions, land use or water use restrictions, dredging moratoriums, fish consumption advisories, and domestic water supply restrictions. Land and water use restrictions and access restrictions may require local legislative action and state administrative action to prevent inappropriate use or development of contaminated areas. At the current time, the only institutional control in place for Green Bay is fish consumption advisories.

13.2 Summary of the Estimated Costs of the Selected Remedy

The total estimated present-worth cost of the selected remedy is $284 million for OUs 3 and 4 and $39.6 million for OU 5 for a total of $323.6 million. The estimated increase in cost to remediate Deposit DD is approximately $0.8 million when remediated with OU 3. This is based on a unit cost developed from the total cost ($283,200,000) for remediation of the volume of contaminated sediment within OUs 3 and 4 (6,466,800 cy). This is an engineering cost estimate that is expected to be within –30 to +50 percent of the actual project cost (based on year 2001 dollars). Changes in the cost elements are likely to occur as a result of new information and data collected during the remedial design. Major changes may be documented in a memorandum in the Administrative Record, an ESD, or a ROD amendment.

13.3 Cleanup Standards and Outcomes for the Selected Remedy

The selection of a remedy was accomplished through the evaluation of the nine criteria as specified in the NCP. A remedy selected for a site must be protective of human health and the environment, comply with ARARs (or justify a waiver), and offer the best balance of tradeoffs with respect to the balancing and modifying criteria in the NCP.

Through the analyses conducted for the RI/FS, the WDNR and EPA have determined that there is an unacceptable risk to human health and the environment from the consumption of fish from the River. It has also been determined that the unacceptable risk will continue for many decades without active remediation of the PCB-contaminated sediment in OU 3 and OU 4. For OU 5, it has been determined that risks will continue for decades under all alternatives, with there being no effective difference between alternatives. Additional modeling of OU 5 will further evaluate this matter.

13.3.1 Achieving Cleanup Standards

The WDNR and EPA believe that the removal of sediment in OU 3 and OU 4 with PCB concentrations greater than the 1 ppm RAL is important to achieving the timely reduction of risks to an acceptable level (i.e., fish can be safely consumed by human or ecological receptors). The WDNR and EPA envision that all sediment in OU 3 and OU 4 contaminated at concentrations above the RAL will be removed. However, this ROD also provides that under certain circumstances a sand cover may be used to supplement the primary dredging remedy in order to reach the risk reduction targets. Pre-remediation sampling and characterization efforts will define a spatial "footprint" (both horizontally and vertically) of the sediment in both Operable Units that has a concentration of PCBs greater than 1 ppm. It is this footprint that is targeted for removal by dredging. If dredging is able to achieve this result (i.e., remove all sediments with PCB concentrations greater than 1 ppm), the active remediation portion of the OU 3 and OU 4 remedy will be complete.

However, if sampling after dredging is completed for OUs 3 and 4 shows that the 1 ppm RAL has not been achieved, a SWAC of 0.26 ppm for OU 3 and of 0.25 ppm for OU 4 may be used to assess the effectiveness of PCB removal. If the SWAC has not been achieved for either OU 3 or OU 4, then the remedy provides certain options to further reduce risk. One option is that additional dredging may be undertaken to ensure that all sediments with PCB concentrations greater than the 1 ppm RAL are removed throughout the particular deposit. Another option would be to place a sand cover on dredged areas to reduce surficial concentrations. The determination of the appropriate option will be made by the Agencies.

13.3.2 Expected Outcomes of Selected Remedy and RAL Rationale

Remedial Action Objectives were developed to provide relative comparisons for different remedial alternatives. RAO 1 relates to achieving surface water quality standards. RAOs 2 and 3 relate to protectiveness for human and ecological receptors. RAO 4 evaluates long-term relative releases to Green Bay and Lake Michigan. RAO 5 considers short-term releases from the potential remedies themselves.

RAO 1 may not be achieved in the foreseeable future because of the stringent regulations for acceptable PCB concentrations in surface waters. Nevertheless, significant risk reduction will occur. Recovery times estimated for RAO 2 (protection of human health) and RAO 3 (protection of ecological receptors) indicate that they will be met well within the defined goals. RAO 4 relates to PCB movement from the River to Green Bay and Lake Michigan. Reductions of loadings as a result of the removal of contaminants in OU 3 and OU 4 will reduce contaminant migration downstream and will therefore contribute to achieving RAO 4. Although the time to recover for Green Bay is not known (because of the time limitations of the models), the substantive reduction of contaminant loading from the River to Green Bay resulting from implementation of the remedy for OU 3 and OU 4 should assist in Bay recovery. RAO 5 is achievable with conventional environmental removal technologies for OU 3 and OU 4 and does not apply directly to the remedy for OU 5.

RAOs 2 and 3 are evaluated in the Alternative-Specific Risk Assessment in the FS by estimating the time required to reach the protectiveness criteria for human health (i.e., removal of fish advisories) and the time required to reach the protectiveness criteria for ecological receptors. This analysis was performed for each of the different remedial action levels and for the alternatives that do not involve contaminant removal, Alternatives A and B.

A PCB concentration of 1 ppm has been selected as the appropriate RAL based on its ability to achieve RAOs for human health and ecological receptors within a reasonable time frame relative to the anticipated costs. This RAL will also reduce the PCB concentration in surface water. Exposures to PCB sediment concentrations above 1 ppm must be eliminated in order to achieve a protective SWAC within a reasonable time frame. This RAL will also reduce and minimize surface water concentrations and the release of contaminants to downstream areas of the River. Studies conducted as part of the Lower Fox River and Green Bay RI/FS indicate that a 1 ppm RAL shows the greatest decrease in projected surface water concentrations relative to the other action levels.

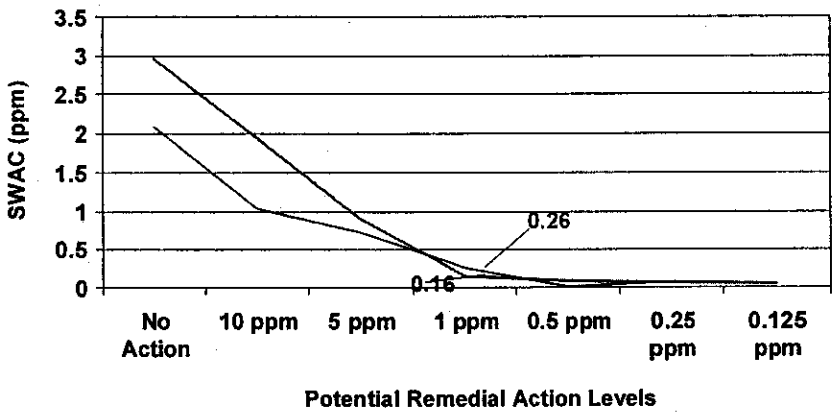
PCB RALs of No Action, 5 ppm, 1 ppm, and 0.5 ppm, were also evaluated. However, those RALs greater than 1 ppm would require a significant amount of additional time to achieve the RAOs for the Site. For those RALs of less than 1 ppm, the RAOs would not necessarily be achieved sooner than they would using the 1 ppm RAL. The RAOs considered in determining the RAL are discussed below for OUs 3, 4, and 5. It is important to note that while absolute numbers are inherently uncertain because of uncertainties in modeling, the relative differences among the RALs are reliable. Furthermore, it should be noted that the Agencies expect that the

Bay may recover more rapidly as a result of the reduction of PCB loading that will occur with the removal of PCBs from the Lower Fox River (OU 1, OU 3, and OU 4). Modeling results may not clearly show this improvement because of the model's time limitations (a maximum of 100 years).

Rationale for Operable Units 3 and 4 – Remedial Action Level of 1 ppm

Figure 13-1 shows the modeling analysis of sediment RALs in comparison with the SWACs, which will result from cleanup to the selected 1 ppm RAL. Modeling suggests that a 1 ppm RAL can achieve an estimated 0.26 ppm PCB SWAC for OU 3 and a 0.16 ppm SWAC for OU 4. A sediment RAL of 1 ppm is the most effective RAL, because the risk declines significantly in a reasonable time period (see Figures 13-2 and 13-3), which will result in achieving risk reduction in the number of years estimated in Table 13-1.

Figure 13-1 Remedial Action Levels and Estimated SWACs for Evaluated RALs for OUs 3 and 4 (from FS Table 5-4 and BLRA Tables 5-33 and 5-34)



As shown in Table 13-1, modeling suggests that a sediment RAL of 1 ppm will lead to fairly rapid declines in PCB fish tissue concentrations. Using the 1 ppm RAL, Table 13-1 projects the number of years until the risk of fish ingestion/consumption declines to acceptable levels for different consumers.

Table 13-1 Estimated Years to Reach Human Health and Ecological Thresholds to Achieve Risk Reduction for Operable Units 3 and 4 at an RAL of 1 ppm

Fish	Receptor	Risk Level Goal	Estimated Years
Operable Unit 3			
Walleye	Recreational Angler	RME Hazard Index of 1.0	9
Walleye	High-intake Fish Consumer	RME Hazard Index of 1.0	17
Walleye	Recreational Angler	RME 10^{-5} cancer risk level	30
Walleye	High-intake Fish Consumer	RME 10^{-5} cancer risk level	42
Carp	Carnivorous Bird	NOAEC	22
Carp	Piscivorous Mammal	NOAEC	43
Operable Unit 4			
Walleye	Recreational Angler	RME Hazard Index of 1.0	20
Walleye	High-intake Fish Consumer	RME Hazard Index of 1.0	30
Walleye	Recreational Angler	RME 10^{-5} cancer risk level	45
Walleye	High-intake Fish Consumer	RME 10^{-5} cancer risk level	59
Carp	Carnivorous Bird	NOAEC	20
Carp	Piscivorous Mammal	NOAEC	45

Notes:
NOAEC – No Observed Adverse Effects Concentration
RME – reasonable maximum exposure

A 1 ppm RAL shows the greatest decrease in projected surface water concentrations in OU 3 and OU 4. Figure 13-2 shows model estimates for PCB surface water concentration 30 years after remediation for OU 3, and Figure 13-3 shows model estimates for PCB surface water concentrations 30 years after remediation for OU 4. Further decline for projected surface water concentrations for an RAL of less than 1 ppm are relatively small in both Operable Units. In other words, selection of an RAL of less than 1 ppm would marginally reduce the SWAC and surface water concentrations. A comparison of various RALs shows the 1 ppm RAL has the greatest relative post-remediation decrease in surface water concentrations.

Figure 13-2 Estimates of Surface Water PCB Concentrations for the Evaluated RALs 30 Years After Completion of Remedial Activities for OU 3

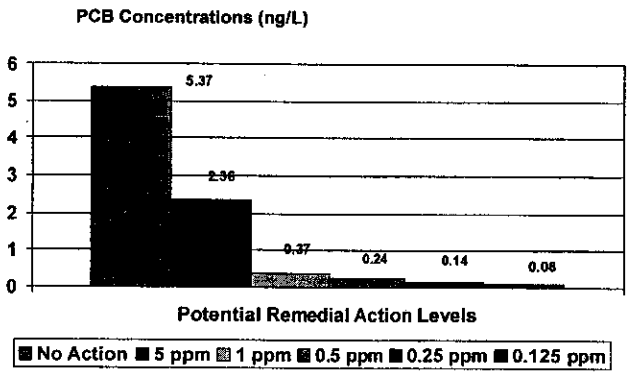
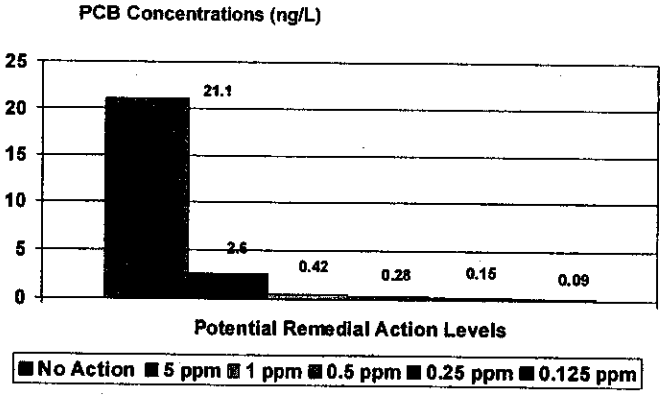


Figure 13-3 Estimates of Surface Water PCB Concentrations for the Evaluated RALs 30 Years After Completion of Remedial Activities for OU 4



RAO 1 relates to achieving surface water quality standards. A comparison of the reduction expected 30 years after completion of the proposed alternative at the 1 ppm RAL to the No Action alternative is presented in Table13-2.

Table 13-2 RAO 1: Surface Water PCB Concentrations 30 Years After Completion of the Proposed Alternative

River Reach	No Action	1 ppm Action Level	% Difference
OU 3	5.37 ng/L	0.37 ng/L	93
OU 4	21.08 ng/L	0.42 ng/L	98

"Acceptable fish tissue concentrations" are levels that would allow unlimited consumption of young-of-the-year fish, recognizing it would take longer for fish (about 5 years for walleye) to become large enough to be legally caught and eaten. "Acceptable risks" assume an acceptable cancer risk less than 10^{-4} (within the EPA's acceptable risk range of 10^{-4} to 10^{-6}) and a hazard index of less than 1. As shown on Figures 13-4 and 13-5, a 1 ppm RAL shows similar relative decreases in relation to acceptable fish tissue concentrations for walleye. Figures 13-4 and 13-5 show that for RAL concentrations greater than 1 ppm, significantly more years will elapse before the risk of fish consumption declines to acceptable levels. Other species of fish show similar reductions and are discussed in detail in Section 8 of the FS. Figures 13-4 and 13-5 clearly show that there is limited additional risk reduction achieved by selecting an RAL of less than 1 ppm.

Figure 13-4 Time to Achieve Acceptable Fish Tissue Concentrations for OU 3

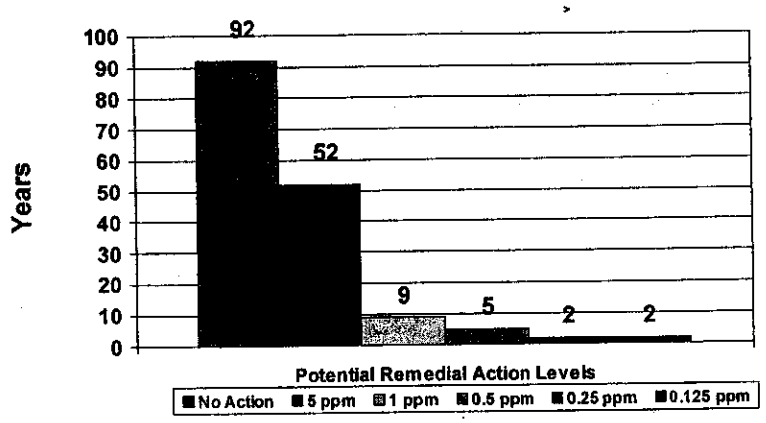
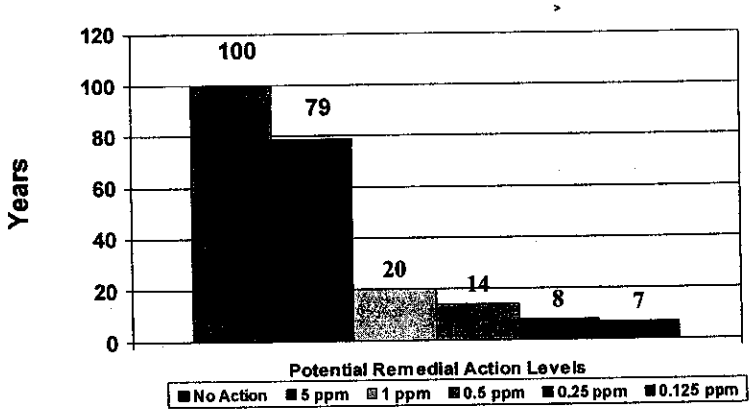


Figure 13-5 Time to Achieve Acceptable Fish Tissue Concentrations for OU 4



Safe fish consumption by birds showed similar relative reductions for the 1 ppm RAL versus other potential cleanup levels (Figures 13-6 and 13-7). Thus, the 1 ppm RAL provides the greatest relative reduction of time required for ecosystem recovery.

Figure 13-6 Time to Safe Fish Consumption by Birds in OU 3

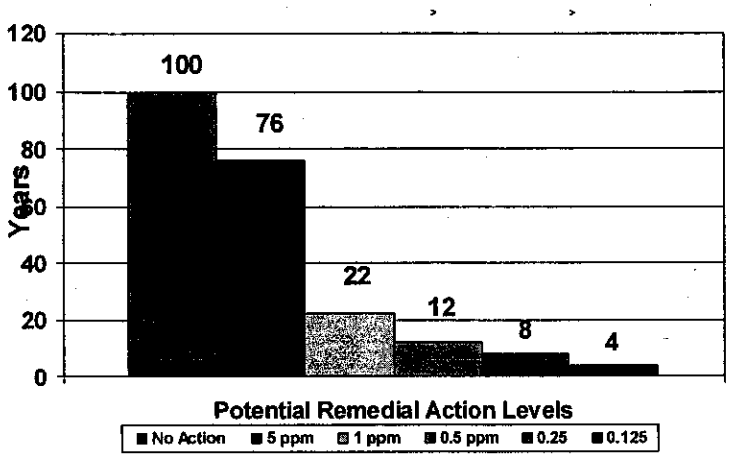
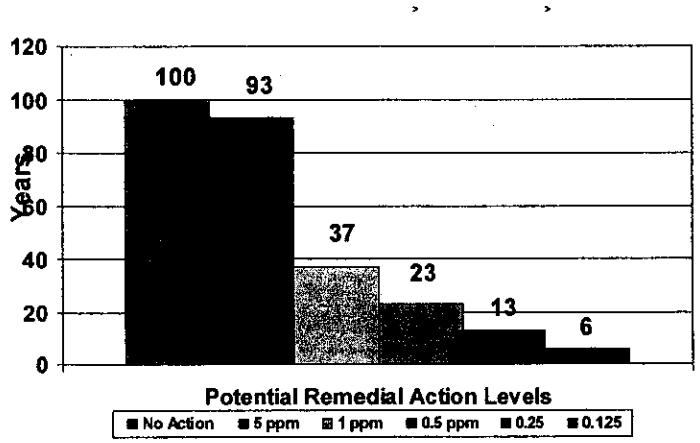
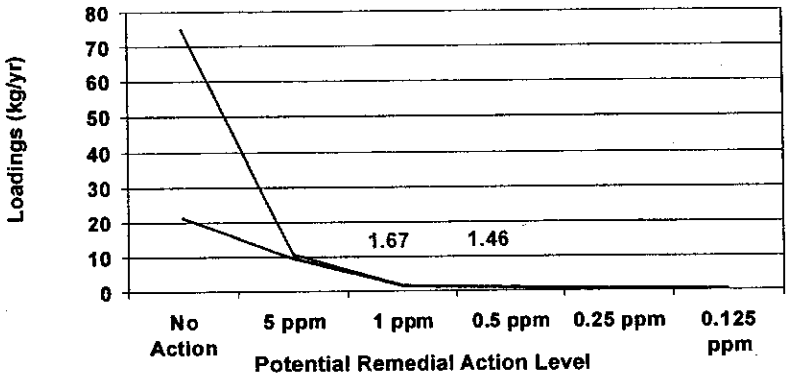


Figure 13-7 Time to Safe Fish Consumption by Birds in OU 4



A 1 ppm RAL is also the most protective based on estimates of downstream loadings (i.e., movement and migration of PCBs into OU 4 of the River and into Green Bay). Downstream loadings of PCBs from OUs 3 and 4 relative to remedial activities are shown on Figure 13-8 for OU 3 and OU 4. The RAL of 1 ppm provides the greatest decrease in downstream loadings relative to the other RALs. Figure 13-8 shows that, with respect to downstream loadings, the 1 ppm RAL level achieves the most reduction when compared to time and cost.

Figure 13-8 RALs and Downstream Loadings in OU 3 and OU 4



A tabular comparison of the reduction expected 30 years after completion of the proposed alternative at the 1 ppm RAL to the No Action alternative is presented in Table 13-3.

Table 13-3 RAO 4: Annual Sediment Loading Rates 30 Years After Completion of the Proposed Alternative

Operable Unit	No Action	1 ppm Action Level	% Difference
OU 3	21.25 kg/yr	1.46 kg/yr	93
OU 4	75.27 kg/yr	1.67 kg/yr	97

In summary, the 1 ppm RAL shows the most significant relative improvement for all the pertinent RAOs, resulting in a protective and cost-effective cleanup level for OU 3 and OU 4.

Rationale for Operable Unit 5 — Monitored Natural Recovery

Green Bay has a water surface area of approximately 2,700 square miles and a water volume of 20 cubic miles. The mean depth of the Bay is approximately 65 feet; the maximum depth is 176 feet. PCB concentrations in the sediment are typically low (i.e., less than 1 ppm) because of the vast sediment volume. Of the total sediment volume in the Bay, the RI estimated only about 2 percent has PCB concentrations greater than 1 ppm and less than 0.2 percent has PCB concentrations above 5 ppm, representing 2.6 and 0.2 percent of the sediment mass, respectively.

The BLRA identifies the risks associated with the OU 5 zones. It appears there is not a significant difference in the human and ecological health endpoints between an aggressive remedial approach throughout the Bay and Alternatives A and B (No Action and MNR), in which no active remediation is undertaken for the Bay. In other words, because of the enormous quantity of Bay sediment contaminated at low levels (PCB concentrations less than 1 ppm), any large-scale Bay remediation would add substantially to remedial costs without significantly reducing risks in the Bay. Costs for active remediation in Green Bay were developed for each Bay zone at 0.5, 1, and 5 ppm action levels. Costs and related issues are discussed in Section 11.3. The cost to implement the MNR alternative in the Bay is $39.6 million.

13.4 Contingent Remedy – *In-Situ* Capping (i.e., "Partial Capping" or "Supplemental Capping")

The WDNR and EPA have selected Alternative C as identified in the Proposed Plan and the RI/FS as the *selected* alternative. However, during the RI/FS public comment period, the Agencies received numerous comments relating to the viability of capping as a possible remedy. An analysis of these comments (discussed in *White Paper No. 5A – Responses to the API Panel Report*, *White Paper No. 5B – Evaluation of API Capping Costs Report*, *White Paper No. 5C – Evaluation of Remedial Alternatives for Little Lake Butte des Morts Proposed by WTMI and P.H. Glatfelter*, *White Paper No. 6A – Comments on the API Panel Report*, and *White Paper No. 6B – In-Situ Capping as a Remedy Component for the Lower Fox River*, attached to the ROD for OU 1 and OU 2) evaluated the viability of a capping-only remedy. This evaluation indicated that a capping-only remedy would not be protective, and would be technically and administratively difficult to implement. The evaluation also indicated that capping would only be technically feasible in some areas. Based on these public comments, the WDNR and EPA have developed a contingent remedy that may supplement the selected remedy in certain circumstances. This capping contingency is different than Alternative F presented in the FS. Alternative F included capping in all areas where certain technical and engineering requirements were met. The pre-design sampling results, the engineering requirements outlined below, and costs would provide the basis for determining whether capping would be appropriate to implement for a particular deposit or subset of deposits. Design considerations would be the basis for determination of the exact deposits that would be capped. This contingent remedy may only be implemented if it meets the following requirements:

1. The contingent remedy, consisting of a combination of dredging and capping, must provide the same level of protection to human health and the environment as the selected remedy. To demonstrate that a cap would provide the same level of protectiveness as the selected remedy, the following would have to be addressed: (a) the potential for PCB releases from flooding and ice scour, as well as advective and diffusional processes; and (b) the potential for a breach of the cap and how that or other potential cap failures mechanisms would be monitored.

2. The contingent remedy must be less costly to implement than the selected remedy.

3. The contingent remedy must not take more time to implement than the selected remedy.

4. The contingent remedy must comply with all necessary regulatory, administrative, and technical requirements, discussed below.

5. The capping contemplated in the contingent remedy will not be permitted in certain areas of OUs 3 and 4:

    - No capping in areas of navigation channels (with an appropriate buffer zone to ensure no impacts to maintenance of the navigation channel)

    - No capping in areas of infrastructure such as pipelines, utility easements, bridge piers, etc. (with appropriate buffer zone)

    - No capping in areas with PCB concentrations exceeding TSCA levels (50 ppm)

    - No capping in areas that do not have sufficient load-bearing capacity

- No capping in shallow-water areas (bottom elevations that would result in a cap surface at elevation greater than –3 feet chart datum without prior dredging to allow for cap placement

In addition to other controls, institutional controls unique to capping would be required to ensure the integrity and protectiveness of capped areas, including restrictions on anchoring or dredging.

Because capping relies on long-term integrity of the cap in a dynamic river environment, long-term monitoring would need to ensure that the cap would remain physically intact and chemical contaminants were contained. For example, in addition to other monitoring requirements, if there were a large storm or other event that could impair a cap's ability to retain contaminants, additional monitoring would likely be required.

Assuming the above criteria are met, capping is considered a viable and protective alternative for OU 3 and OU 4 and may be implemented. The specific areas where caps could be placed will be determined during design. Design will be based, in part, on considerations included in *White Paper No. 6B – In-Situ Capping as a Remedy Component for the Lower Fox River*, attached to the ROD for OU 1 and OU 2. To ensure the permanence of an OU 3 cap, permanent maintenance of the De Pere dam would be required.

13.5 Basis for Implementing the Contingent Remedy (OUs 3 and 4)

The contingent remedy may be employed in OUs 3 and 4 to supplement the selected dredging remedy if one or both of the following criteria are satisfied. The decision as to whether one or both of the criteria have been satisfied will be made solely by the EPA and WDNR.

1. It can be predicted with a high degree of certainty based on sampling results (taken after a sufficient amount of contaminated sediment in OUs 3 and 4 has been dredged) that a PCB SWAC of 0.26 ppm for OU 3 and 0.25 ppm for OU 4 would not be achieved by dredging alone, or

2. Capping would be less costly than dredging and would provide the same level of protection to human health and the environment as the selected remedy, as evaluated in accordance with the protectiveness provisions and the nine criteria in the NCP (40 CFR 300.430).

The selected dredging remedy would still be completed in areas not capped. Based on estimates in the FS, and because of limitations on where capping could be performed, capping would be limited to about 40 percent of the total volume of contaminated sediments in OU 3 and OU 4. Selection and implementation of this contingency would be documented in an ESD.

It should be noted that if dredging alone achieves cleanup standards, and the contingent remedy is not shown to be more cost-effective than dredging alone, then capping would not be implemented.

13.6 Description of Contingent Remedy

The contingent remedy, which may supplement the selected remedy, consists of the following components:

- **Cap Design:** Cap construction specifications would be determined during design. Although the FS envisioned a cap composed of 20 inches of sand overlaid with 12

inches of large cobble "armor" to provide erosion protection, the final cap design would be based on predicted performance. The final cap design must have sufficient thickness to ensure containment of contaminants, resistance to burrowing organisms, and "armoring" to provide sufficient permanence and resistance to erosion and scour.

- **Demobilization and Site Restoration:** Demobilization and site restoration would require removing all capping-related equipment, fencing, facilities, etc., from staging and work areas.

- **Monitoring:** Operations and maintenance monitoring would be required to ensure proper placement, maintenance of cap integrity, and isolation and containment of contaminants. For this type of capping, monitoring would be performed to ensure that the cap is placed as intended, the necessary capping thickness is maintained, and contaminants are contained and do not become bioavailable. In addition to other dredging-related monitoring, cap monitoring would include bathymetric or side-scan sonar profiling, sediment and cap sampling, and capture and analysis of pore water that may migrate through the cap, as well as diver inspections to ensure that the cap is intact and containing contaminants. Additionally, provisions would have to be made for cap repair should that be necessary.

- **Institutional Controls:** Institutional controls may include deed restrictions, Site access and anchoring limitations, and continuation of fish and waterfowl consumption advisories, as appropriate. Access restrictions could include limitations on the use or development of capped areas, possibly requiring local legislative action and state administrative action. These controls and limitations are intended to ensure the permanence of the cap and to minimize reexposure and/or migration of contaminants. Deed and access restrictions, dredging moratoriums, and other limitations (e.g., no anchor zones) on the use or development of capped areas would continue in perpetuity or until contaminants were removed or rendered nontoxic. Fish consumption advisories would continue until fish contaminant concentrations reach levels protective for human health and the environment. Monitoring in perpetuity would likely also be required, as the cap would need to permanently contain contaminants.

13.7 Estimated Costs of the Contingent Remedy

Costs would be determined prior to implementation of capping. Estimates of capping costs would be documented in an ESD.

13.8 Use of Vitrification Technology

The Agencies have selected land disposal as the technology for managing dewatered dredged material from the Lower Fox River. In Section 10.2 of this ROD, an option to use vitrification is identified. This section discusses vitrification and provides the basis upon which it can be used as part of the remedy for OUs 3 and 4. If successfully implemented, vitrification is an effective technology, has the added benefit of destruction of PCBs, and would allow beneficial reuse of dredged sediment. However, if vitrification is used instead of disposal of contaminated sediments, the Agencies would issue a ROD Amendment, consistent with the requirements of the NCP.

Certain criteria must be considered prior to the use of vitrification. These criteria include the ability of vitrification technology to treat the chemicals of concern, the cost of constructing and operating a vitrification facility, the amount of dredged material that would be managed at the vitrification facility, and issues related to siting a facility.

- **Vitrification Technology.** As part of the evaluation of technologies in Section 6 of the FS, vitrification was evaluated as the representative process option for thermal treatment. Vitrification is a high-temperature process (2,500 to 3,000 °F) that destroys organic compounds (e.g., PCBs) while melting the contaminated sediment into glass aggregate material. Inorganic contaminants (e.g., most heavy metals) are contained in the glass matrix of the aggregate. Vitrification units can be operated to achieve the 99.9999 percent destruction removal efficiency requirement for PCBs. In cooperation with and supported by funding from the WDNR and EPA Great Lakes National Program Office, Minergy Corporation has undertaken a multi-phase study to evaluate the feasibility of vitrification technology, based on glass furnace technology, to treat PCB-contaminated sediment. The EPA's Superfund Innovative Technology Evaluation (SITE) program has also participated in this study and conducted an independent evaluation of the cost and treatment effectiveness of the technology. Reports prepared by Minergy and submitted to the WDNR and EPA did demonstrate the effectiveness of the technology and provided initial cost information. While the SITE report is not yet final, initial indications are that vitrification using glass furnace technology has been demonstrated to be successful at treating PCB-contaminated sediment.

- **Amount of Dredged Material to be Managed.** Estimated quantities to be dredged are 595,800 cy from OU 3 (including Deposit DD) and 5,880,000 cy from OU 4, for a total quantity of approximately 6.5 million cy. Once dewatered to 55 percent solids, this quantity is equivalent to approximately 3.6 million wet tons of filter cake. When converted to dry tons for comparison with the tables presenting unit cost estimates in the Minergy report, this quantity is approximately 1.98 million dry tons.

- **Cost to Construct and Operate.** As part of a contract with the WDNR, Minergy Corporation prepared a study entitled *Revised Unit Cost Study for Commercial Scale Sediment Meter Facility – Glass Furnace Technology*. This study provides additional information on capital and operating costs of a vitrification facility. Various parameters influence the unit cost of a vitrification facility, such as the amount of dredge material processed, the water content of the dredge material, the size of the plant needed to process the dredge material, the amount of glass produced, annual days of operation, and the assumed value of the glass, as well as initial capital construction costs and operating costs. Based on work documented in the FS, the following values were developed for these parameters:

Amount of dredge material	3,600,000 wet tons
Water content of dredge material	55%
Plant size	750 to 1,125 tons/day
Project life	7 to 10 years
Annual operating days	240 to 350 days
Amount of glass produced	180,000 to 270,000 tons
Assumed value of the glass	$2 to $25 per ton

  Following these assumptions, the unit cost ranges from $32.21/ton to $53.04/ton on a wet ton basis. Consequently, the cost to manage all the dredge material from OU 3 and OU 4 using vitrification could range upwards to $191 million. Note that the unit costs increase as the amount of material managed at a vitrification facility decreases. Also note that this cost does not include dewatering.

- **Siting of a Disposal Facility.** Siting a location to construct a passive dewatering facility and a monofill to dispose of all the dredged material from OUs 3 and 4 presents several challenges. The passive dewatering and monofill disposal facilities are key features in the cost-effectiveness of the selected remedy. The challenges to siting these facilities

include finding a site with the necessary geophysical characteristics, such as favorable geology; the need for a large land area to place these facilities; and the need to go through the state's siting process for the disposal facility. Current land area estimates are approximately 327 acres for the dewatering cells and approximately 121 acres for the disposal facility, for an approximate total of 448 acres. Although it may be possible to restore the area used for the dewatering cells to an alternative use or to the previous use, the disposal facility will be permanent. Such parcels of land are available in southern Brown County, but these parcels would still have to be procured. Part of the site evaluation process will be to determine whether existing properties having the necessary physical characteristics are available and whether there are concerns related to wetlands, sensitive habitat, or archaeological or historical matters. The state's siting law requires that the owners of a proposed landfill negotiate a host agreement with the community in which the landfill will be located. These negotiations can place limits on the size and operation of a landfill and the type of materials accepted, can lead to negotiation of a host community fee, and can be time consuming. An inability to successfully negotiate an agreement may result in the need to seek an alternative location for the proposed disposal facility or to seek a means to manage the dredge material, such as vitrification.

In summary, vitrification is a potentially viable technology for the management of dredge material for the Lower Fox River. The Agencies will allow for vitrification technology to be used on all or part of the contaminated sediment dredged from the River under any of the following circumstances. The decision as to whether the following criteria have been satisfied will be made solely by the EPA and WDNR.

1. **Protection of Human Health and the Environment.** Vitrification must provide the same level of protection to human health and the environment as the selected remedy as evaluated in accordance with the protectiveness provisions and the nine criteria in the NCP (40 CFR 300.430).

2. **Lack of Disposal Capacity.** If, following attempts to secure land and site a monofill disposal facility for dredge material management, there is either no disposal capacity or insufficient disposal capacity.

3. **Costs.** In the event that costs to site, construct, and operate a disposal facility are unacceptable to the responsible parties or the incremental increase in cost to permanently destroy PCBs is unacceptable, the responsible parties can use vitrification as an alternative means of disposal.

It is also important to note that given the need for a higher percent solids in the dewatered material, it is likely that mechanical dewatering would have to be used in lieu of passive dewatering. If this happens, it may lead to higher costs to implement the remediation of OUs 3 and 4. In the event that use of vitrification technology is proposed, the public would be informed and public input would be sought on the proposal to use this technology, as well as on the rationale concerning its selection, implementation, and cost, through a ROD amendment.

14 STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the remedies that are selected for Superfund sites are required to be protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery

WISCONSIN ADMINISTRATIVE CODE
DEPARTMENT OF NATURAL RESOURCES
CHAPTER NR 157. MANAGEMENT OF PCBS AND PRODUCTS CONTAINING PCBS
Current through Reg. No. 571 (July 2003).

NR 157.07 Disposal methods and facilities.

(1) METHODS. PCBs or products containing PCBs (liquids, semisolids) for which a technically and economically feasible incineration method is available for destruction shall be incinerated unless approval for an alternative method of disposal is obtained in writing from the department. Solid or semi-solid products containing PCBs for which a technically and economically feasible incineration method is unavailable shall be disposed of at a landfill facility unless approval for an alternative method of disposal is obtained in writing from the department.

(2) INCINERATION FACILITIES. Facilities for incineration of PCBs or products containing PCBs shall not be established or operated in the state of Wisconsin until written approval of the department is obtained.

(a) Complete plans and specifications for an incineration facility shall be submitted to the department in accordance with all applicable provisions of chs. NR 400 to 499 and 600 to 690.

(b) Minimum requirements for incineration of PCBs and products containing PCBs include suitable balance of operational parameters (dwell time, temperature, turbulence, and excess oxygen) and a suitable scrubber to remove hydrochloric acid mist from the exhaust gas. Recommended requirements are 2 second dwell time at 1100° C (2000° F) and 3% excess oxygen in the stack gas or 11/2 second dwell time at 1500° C (2700° F) and 2% excess oxygen in the stack gas.

(3) LANDFILL FACILITIES. A landfill for disposal of PCBs and products containing PCBs shall not be established or operated in the state of Wisconsin until written approval of the department is obtained for such disposal as provided in s. NR 660.13 (2) (a). The proposed landfill shall be established and licensed in accordance with the requirements of chs. NR 630, 660 and 680 and other requirements applicable to disposal of PCBs and products containing PCBs. Such a landfill must provide complete long-term protection for the quality of surface and subsurface waters from PCBs deposited therein and must prevent hazards to public health and the environment. Such sites must be located or engineered to avoid direct hydraulic continuity with surface and subsurface waters. Generated leachates must be contained and subsurface flow into the disposal area eliminated. Monitoring wells must be established, and a sampling and analysis program conducted as specified in s. NR 660.14.

(4) The operator of the incineration or landfill facility shall upon utilization or final disposal of the PCBs or products containing PCBs sign the remaining copies of the waste tracking form, retain a copy and immediately mail a copy to the generator, full-service contractor, or service facility.

(5) FACILITIES RECOMMENDED FOR PCB PROCESSING AND DISPOSAL. (a) The department shall maintain a current listing of incinerators and secured landfill sites which are specifically approved by the various state environmental agencies or which may be suitable for disposing of PCBs or products containing PCBs. This list shall provide the names of organizations offering suitable disposal services, including locations and facilities available to any person upon request. However, specific shipping directions, disposal procedures and costs shall be obtained from the organization.

(b) The department will consider applications for alternate disposal procedures and alternate disposal sites provided the applicant can demonstrate that the alternatives will not result in environmental pollution. Within 90 days of the receipt of an application for an alternate disposal method or disposal site, the department shall notify the applicant of approval or rejection or shall specify the additional information which is required to determine whether to approve the proposed procedures or sites.

History: Cr. Register, August, 1977, No. 260, eff. 9-1-77; am. (2) (a) and (3) Register, July, 1981, No. 307, eff. 8-1-81; am. (2) (a) and (3), Register, January, 1991, No. 421, eff. 2-1-91; corrections in (2) (a) and (3) made under s. 13.93 (2m) (b) 7., Stats., Register September 2002 No. 561.

WI ADC s NR 157.07
END OF DOCUMENT